

Project Initializations and Planning Phase

Date	10 July 2024
Team ID	SWTID1720001058
Project Title	Panic Disorder Detection
Maximum Marks	3 Marks

Project Proposal (Proposed Solution) template

This project proposal outlines a solution to address a specific problem. With a clear objective, defined scope, and a concise problem statement, the proposed solution details the approach, key features, and resource requirements, including hardware, software, and personnel.

Project Overview	
Objective	The detection of panic disorder involves recognizing the symptoms of panic attacks, assessing their frequency and impact, and conducting a thorough evaluation by mental health professionals. Early detection and appropriate treatment can significantly improve the quality of life for individuals with panic disorder.
Scope	The project focuses on detecting panic disorder based on structured data (e.g., symptom profiles, physiological data) or unstructured data (e.g., text from patient descriptions).
Problem Statement	
Description	The problem to be addressed is the detection of panic disorder using machine learning techniques. Panic disorder is a type of anxiety disorder characterized by recurrent and unexpected panic attacks, which are sudden periods of intense fear or discomfort that may include symptoms such as rapid heart rate, sweating, trembling, shortness of breath, and feelings of impending doom.
Impact	<ul style="list-style-type: none"> • Early Intervention: Detecting panic disorder early allows for prompt intervention, potentially reducing the severity of symptoms and improving patient outcomes. • Cost Efficiency: Early detection can lead to reduced healthcare costs by preventing unnecessary emergency visits and hospitalizations associated with untreated panic attacks.

	<ul style="list-style-type: none"> • Personalized Treatment: Machine learning enables more personalized treatment plans by providing clinicians with data-driven insights, leading to more effective and targeted interventions for individuals with panic disorder.
Proposed Solution	
Approach	<ol style="list-style-type: none"> 1. Data Collection and Preprocessing: <ul style="list-style-type: none"> • Collect relevant data sources including symptom profiles, demographic information, and potentially physiological data. • Preprocess data to handle missing values, normalize features, and possibly apply text preprocessing techniques for unstructured data. 2. Feature Engineering and Selection: <ul style="list-style-type: none"> • Identify relevant features such as specific symptoms, demographics, or derived features that may enhance predictive accuracy. • Select features that contribute most to distinguishing individuals with panic disorder from those without. 3. Model Selection and Training: <ul style="list-style-type: none"> • Choose appropriate machine learning algorithms (e.g., logistic regression, random forest, deep learning) based on the nature of the data and problem complexity. • Train models using labeled data, employing techniques like cross-validation to optimize model performance and avoid overfitting. 4. Evaluation and Validation: <ul style="list-style-type: none"> • Evaluate model performance using metrics like accuracy, precision, recall, and area under the receiver operating characteristic curve (AUC-ROC). • Validate models on unseen data to ensure generalizability and robustness. 5. Deployment and Implementation:

	<ul style="list-style-type: none"> Implement trained models into practical applications, potentially integrating them into clinical decision support systems or mobile health platforms. Ensure deployment considerations such as scalability, security, and compliance with healthcare regulations. <p>6. Ethical Considerations:</p> <ul style="list-style-type: none"> Address ethical implications related to patient privacy, consent, and fairness in algorithmic decision-making throughout the project lifecycle.
Key Features	<ul style="list-style-type: none"> Integration of Multimodal Data: The solution integrates diverse data sources, including structured data (symptom profiles, demographics) and unstructured data (textual descriptions), enabling a comprehensive analysis that considers both quantitative and qualitative aspects of the disorder. Personalized Detection Models: Machine learning allows for the development of personalized detection models that can adapt to individual variations in symptoms and demographic factors. This enables more accurate and tailored diagnostic outcomes compared to one-size-fits-all approaches. Enhanced Early Intervention: By emphasizing early detection, the solution facilitates timely intervention and support for individuals at risk of or experiencing panic disorder. This proactive approach aims to mitigate the impact of symptoms and improve overall patient outcomes through timely treatment.

Resource Requirements

Resource Type	Description	Specification/Allocation
Hardware		
Computing Resources	CPU/GPU specifications, number of cores	2 x NVIDIA RTX3040 16 CORES ,Intel i5
Memory	RAM specifications	16GB

Storage	Disk space for data, models, and logs	512 GB SSD -nil-
Software		
Frameworks	Python frameworks	Flask.
Libraries	Additional libraries	Matplotlib,Seaborn,Sklearn,scikit-learn, pandas, numpy.
Development Environment	IDE, version control	Jupyter Notebook, Github,VS Code,Anaconda Navigator.
Data		
Data	Source, size, format	https://www.kaggle.com/datasets/muhammadshahidazeem/panic-disorder-detection-dataset Size: 10,000 Records Format:Excel sheet(csv file)